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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,782	02/02/2001	Raymond Grant Rowe	RD-24,364	8533

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EXAMINER
WILKINS III, HARRY D

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 11/07/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/773,782	ROWE ET AL.	
	Examiner	Art Unit	
	Harry D Wilkins, III	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) *8-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 18-35* is/are rejected.

7)☒ Claim(s) *1-7 and 18-35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-35 are pending. Claims 8-17 are withdrawn from consideration as being drawn to a non-elected invention.

2. The rejection under 35 USC 112, 2nd paragraph has been withdrawn in view of the amendment filed 19 September 2002.

Claim Objections

3. Claims 1-7 and 18-35 are objected to because of the following informalities: "zirconium alloy" should be amended to state that the balance of the composition is zirconium, e.g.-"zirconium-base alloy", "zirconium-based alloy". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> **A person shall be entitled to a patent unless –**
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-7 and 18-25, 28 and 30-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Inagaki et al (US 4,810,461).

Inagaki et al anticipate the invention as claimed. Inagaki et al teach (see abstract) an α-zirconium-based alloy that is used as a nuclear fuel cladding. Inagaki et al do not expressly teach that the α-phase of the zirconium is coarse-grained lath α microstructure. Inagaki et al teach (see col 5, lines 7-68) that the method of processing the zirconium alloy is quenching from a β-phase temperature (i.e.-beta heating treating

followed by fast quenching), repeating the steps of cold working and annealing (i.e.- performing at least 2 steps of cold working and annealing). The annealing is conducted at 550-640°C. Inagaki et al teach (see col 9, lines 16-27) that the cold working step can be at 40% working ratio and that the final annealing occurred at a temperature above the recrystallization temperature.

With respect to the property of the coarse grained lath α microstructure, the method of forming the alloy taught by Inagaki et al is substantially identical to the disclosed process, therefore, one of ordinary skill in the art would have expected that the products taught by the reference would inherently have the same coarse grained lath α microstructure as claimed.

"Where the claimed and prior art products are identical or substantially identical in structure or composition or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, In re Best 195 USPQ 430, 433 (CCPA 1977). 'When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing they are not.' In re Spada, 15 USPQ2d 1655, 168 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best 195 USPQ 430, 433 (CCPA 1977)." See MPEP 2112.01

Regarding claims 2, 3, 18, 19, 31 and 32, Inagaki et al teach (see col 4, lines 42-54) that the alloy contains small second phase precipitates, specifically Sn_2Ni_3. The size of the particles is less than 0.2 μm.

Regarding claims 4, 5 and 34, because the process taught by Inagaki et al is substantially identical to the method employed in the present invention, one of ordinary skill in the art would have considered the zirconium alloy of Inagaki et al to inherently possess a less than 50% partially recrystallized microstructure as claimed.

Regarding claims 6, 7 and 35, because the process taught by Inagaki et al is substantially identical to the method employed in the present invention, one of ordinary skill in the art would have considered the zirconium alloy of Inagaki et al to inherently possess an acicular structure which includes a lath spacing within the range of 0.5-3.0 μm as claimed.

Regarding claims 20 and 33, because the process taught by Inagaki et al is substantially identical to the method employed in the present invention, one of ordinary skill in the art would have considered the zirconium alloy of Inagaki et al to inherently possess second phase precipitates which include at least one of Fe and Cr as claimed.

Regarding claim 21, the composition disclosed by Inagaki et al (see Table 1, spanning cols 8-9) in examples 18-20, 25 and 26 is within the presently claimed range of composition. The alloy is subjected to a predetermined process.

Regarding claim 22, the method of treatment disclosed by Inagaki et al above is identical to the claimed method except for the inclusion of additional steps at the end. However, the present claim recites a method "comprising" a list of steps. This language is read to be open to the inclusion of additional processing steps.

Regarding claims 23 and 24, Inagaki et al teach (see col 9, lines 16-27) that the cold working step can be at 40% working ratio. This value is about 36%.

Regarding claim 25, Inagaki et al teach (see col 9, lines 16-27) that the beta heat treating occurs at 1000°C.

Regarding claim 28, Inagaki et al teach (see col 5, lines 57-59) that the preferred temperature for the annealing is 550-640°C.

Regarding claim 30, see above regarding claim 1, especially the processing limitations.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 26 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inagaki et al (US 4,810,461).

The teachings of Inagaki et al are described above in paragraph no. 5.

Inagaki et al do not teach that the beta heat treatment occurs for a duration of 1 to 10 seconds.

Inagaki et al teach (see col 5, lines 50-56) that the beta heat treating occurs in as short a time as possible because extended times at temperature causes an undesirably growth of the crystal grains.

Therefore it would have been obvious to one of ordinary skill in the art to have reduced the amount of time at temperature to be 1-10 seconds as claimed in order to avoid any undesirable growth of the crystal grains.

Regarding claim 29, Inagaki et al do not teach that the annealing occurs at 620°C for 4 hours. However, it would have been within the expected skill of a routineer in the art to have optimized the time and temperature of the heat treatment within the disclosed ranges in order to maximize the properties produced by the recrystallization.

8. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inagaki et al (US 4,810,461) in view of Cheadle (US 4,065,328).

The teachings of Inagaki et al are described above in paragraph no. 5.

Inagaki et al do not teach that the fast quenching occurs at 20-200°C/second.

Cheadle teaches (see abstract) a zirconium-based alloy, but also teaches (see col 1, lines 35-38) that fast quenching (more than 11°C/second) from the β-phase region causes the β-phase to transform into α-phase needles (i.e.-acicular or lath microstructure).

Therefore, it would have been obvious to one of ordinary skill in the art to have applied the fast quenching at a high rate in order to produce the lath α-microstructure.

Response to Arguments

9. Applicant's arguments filed 19 September 2002 have been fully considered but they are not persuasive. Applicant has argued that the further cold working and annealing steps of Inagaki et al destroy the coarse grained lath alpha microstructure.

In response to Applicant's argument, this assertion is not supported by facts. Applicant should provide data in the form of a declaration under 37 CFR 1.132 showing that when the additional steps are carried out, the lath alpha microstructure is no longer present. In addition, Applicant claims a zirconium alloy "comprising" the lath alpha phase. Thus, if any of the lath alpha phase remains, then the claim would be anticipated, even if only 0.0001% of the microstructure was lath alpha phase. It should be noted that Inagaki et al disclose a method that includes at least two cycles of cold working and annealing, even though the example has three cycles. The closest prior art

in this case would be a process with two cycles. The Examiner contends that after two cycles, not all of the lath alpha phase would be destroyed.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-Th 6:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III
Examiner
Art Unit 1742

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

hdw
November 5, 2002